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Digitizing Physical Objects in the Home

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Technology in the home has brought about a number of changes in the way things are being done. Particularly interesting is the question as to whether some ways of doing activities are now being replaced given the availability of technology at an affordable cost. The ownership of a home computer and particularly a 'connected' computer has brought about significant changes. Rather than hopping in the car and driving to the mall and shopping, you can now simply 'online shop' without leaving home. The inside of a bank is most likely foreign to many people not just because of ATM machines, but also because of the sophisticated online banking sites where accounts can be tracked, bills can be paid and loans can be processed.

To obtain some idea of how widespread digital replacement is, we look at five household objects that have been very standard for a number of years – the telephone, the newspaper, the file cabinet with family records, the TV, and the photo album. A national sample of households were queried regarding the extent to which there has been digital replacement in the home.² They were given the following question: "For some people the computer has provided a way of replacing a physical device or object with a digitized version. On a scale of 1 to 5 where 1 is 'not at all' and 5 is 'completely,' please tell me the extent to which each of the following has happened in your household." Below are the results. We also look at the extent to which the changes observed may be a function of age, education level, and household income.

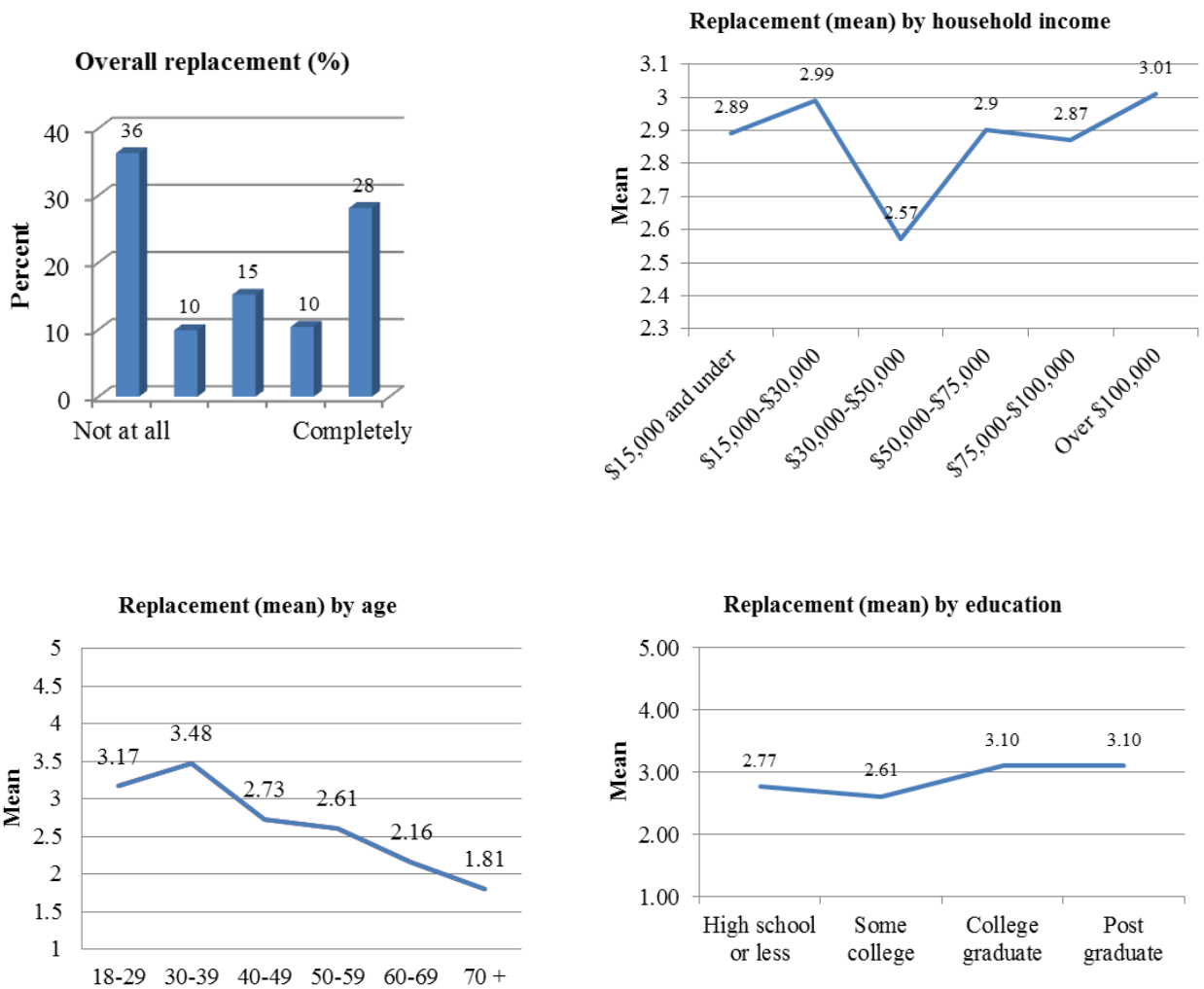
Replaced a physical newspaper with online news. The physical newspaper appears to be on its way out, being replaced by information and news services available on the Internet. There is still a split between those who report having replaced a physical newspaper with online news versus those who have not, with 36% reporting that they

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² The survey was conducted using a national RDD sample. Any adult 18 years and over who was knowledgeable about the household's use of computers in the home was eligible to be interviewed. A total of 1,200 interviews were completed, with 1030 respondents with a landline phone, and 170 interviews with respondents who have only a cell phone and no landline in the home. AAPOR response rates for the cell phone sample: response rate 1 = .217; response rate 2 = .223; response rate 3 = .235; response rate 4 = .241. AAPOR response rates for the landline sample: response rate 1 = .216; response rate 2 = .229; response rate 3 = .290; response rate 4 = .307. The survey was conducted by telephone by Abt SRBI (New York) during the period of April 15, 2010 to May 24, 2010. The interview took approximately 18-20 minutes.

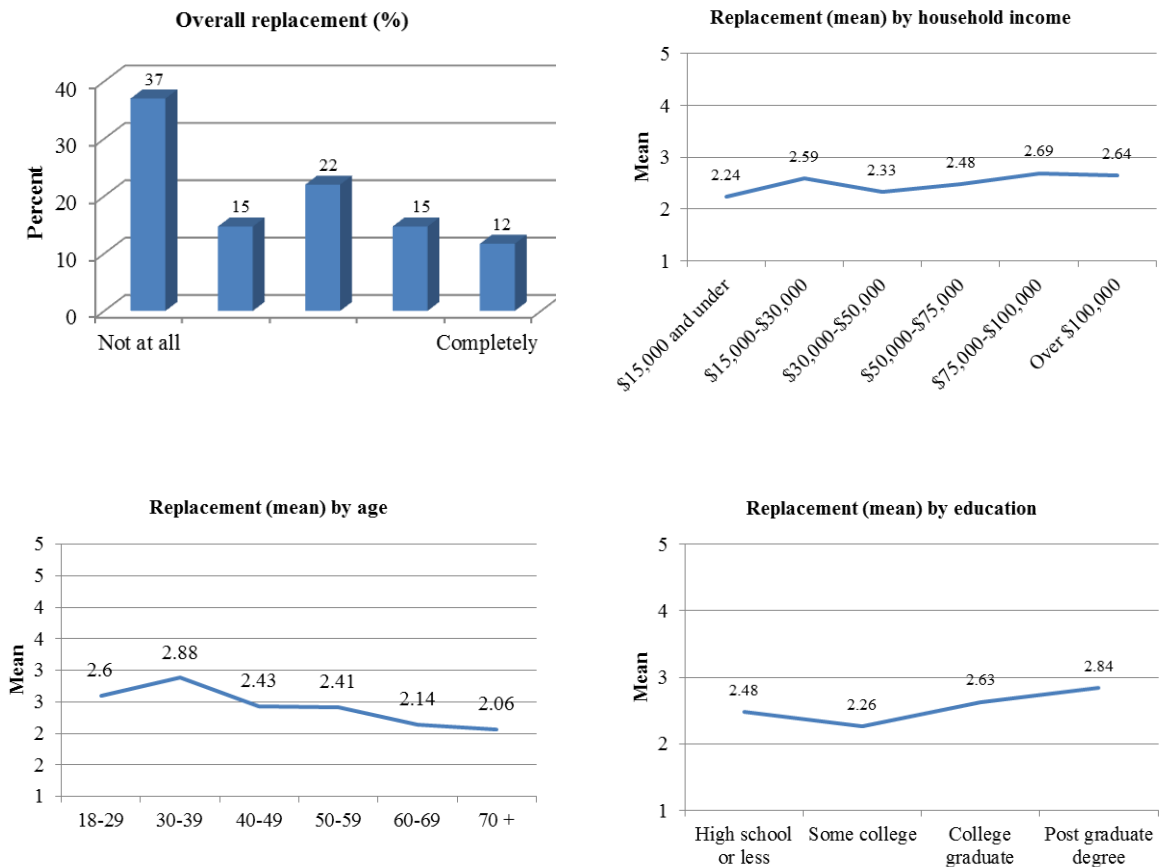
have not replaced the physical newspaper in contrast to 28% reporting they have completely switched to online news. See Figure 1 for overall distribution and breakdowns by age, education, and household income. While there is still a sizeable percent subscribing to or buying a newspaper, it is important to note that age is a significant factor. Age is associated, with younger adults more likely to report the switch than older adults. About one-third of those age 18-29 report that they have completely replaced the physical newspaper and a whopping 49% of those age 30-39 report replacing the physical newspaper with a digital version. Similarly, education is a factor with college graduates significantly more likely to have made the change than those with a high school education or even some college education. Income is much less linear with lower incomes (under \$30,000) and higher incomes (over \$100,000) more likely to have switched in contrast to mid-level incomes.

Figure 1. Physical newspaper replacement with online news overall and by age, income, and education



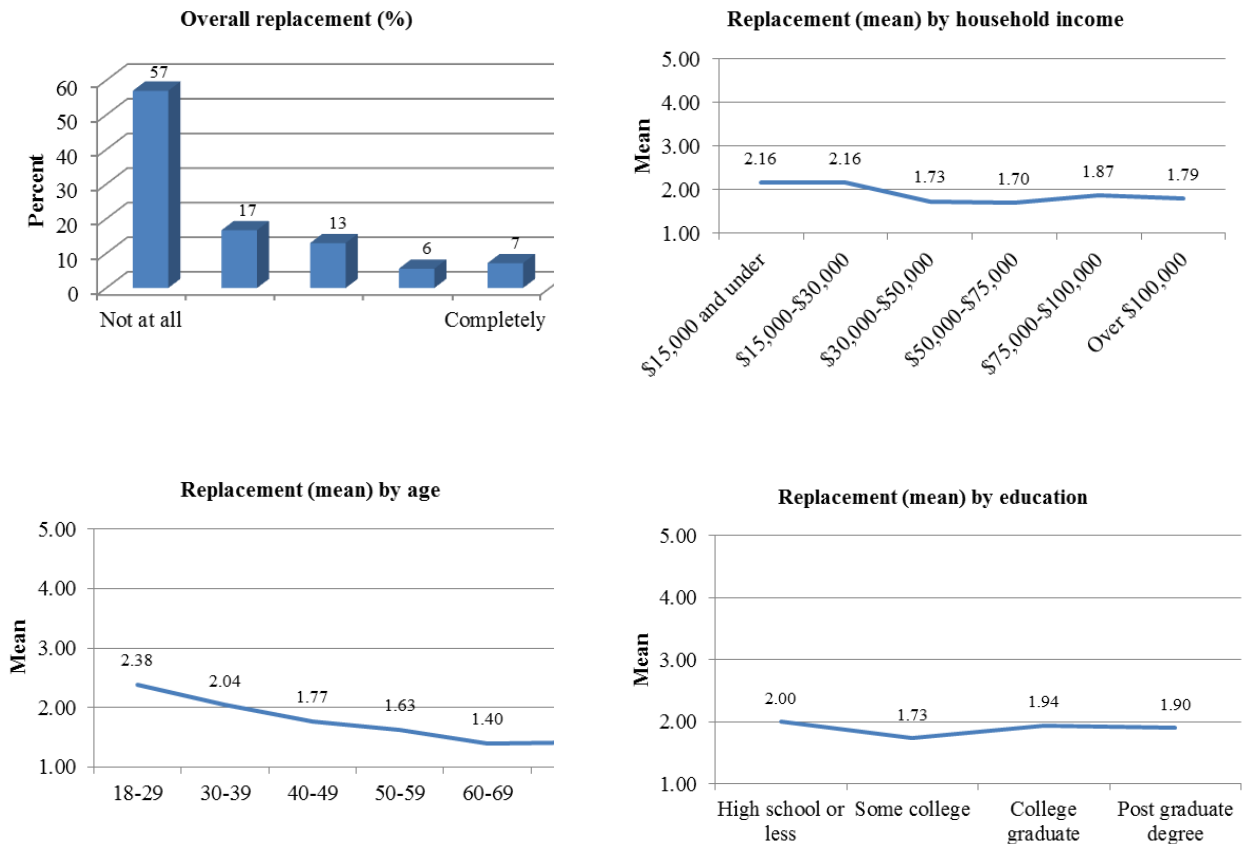
Replaced paper records such as bills, insurance claims, maintenance contracts, and warranties with digital versions. While the future of physical newspapers seems clear, the paperless home is still a part of the future with over half of households relying on paper records over digital versions. About one in ten households report being paperless in terms of records of bills, insurance claims, contracts and warranties, etc. There is a less clear demarcation of what types of households are more paperless than others. Income variations are not very clear cut although higher incomes are slightly more likely to store digital versions of records. Age again shows a decline in digitization of household records, with those 60 and over significantly less likely to have given up paper records than those who are younger. Similarly, those households with higher levels of education are more likely to have made the transition to digital records than those with lower levels. Nonetheless, no group is truly committed to paperless. By income level, the percent range for completely replacing paper records is as low as 8% (households between \$30,000 and \$50,000) to a high of 15% (households between \$75,000 and \$100,000). For age groups, the range is from 4% (age 70 and over) to a high of 20% (ages 30-39).

Figure 2. Replaced paper records with digital versions overall and by age, education, and household income



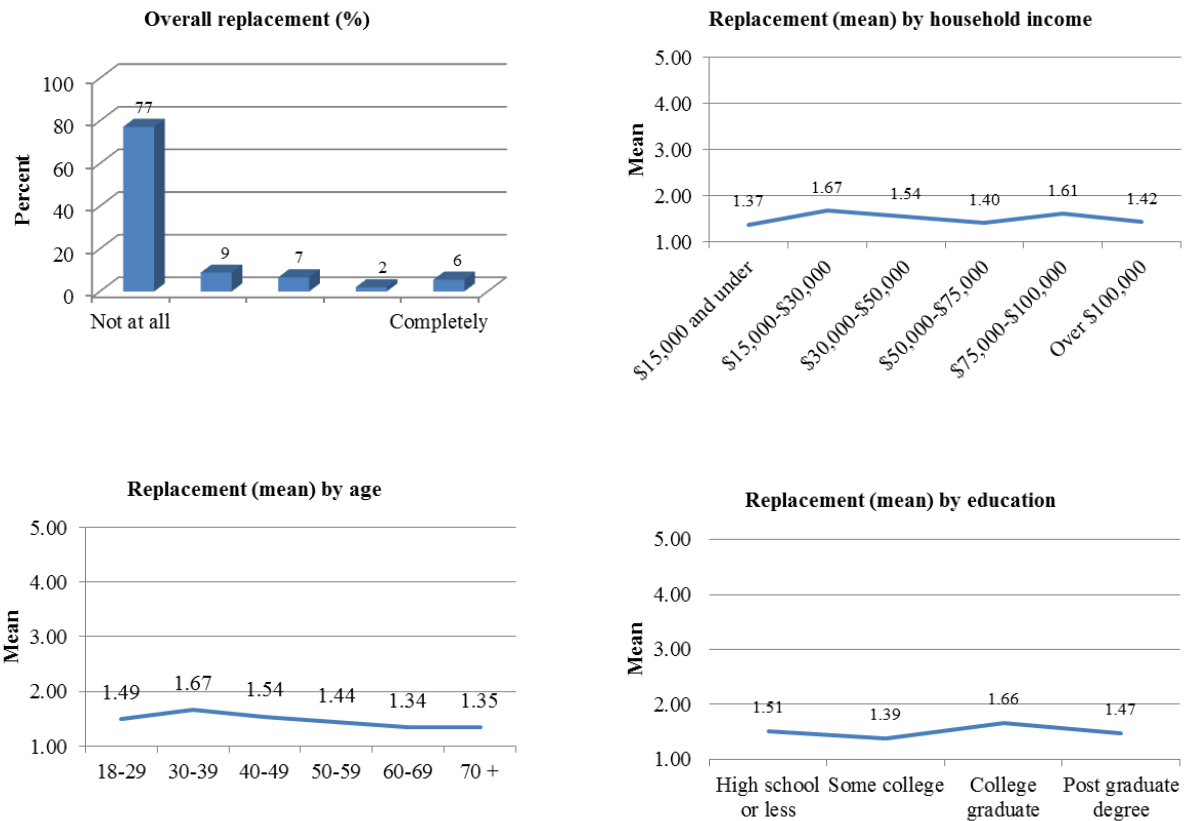
Replaced watching programs and movies on a TV to watching them on a computer or hand-held device. The TV is not going away too soon. While there are new websites that have TV programs and movie rental companies such as NETFLIX that are now offering streaming movies for viewing, nearly three-fifths (57%) of households report that they have not replaced the TV with a computer or hand-held device for viewing programs and movies. Only about 7% reported that they have made the change to watching TV on the computer. Age is clearly a factor; as age increases, the likelihood of using a computer as a TV decreases. There is a higher proportion of experimentation with the use of the computer as TV in the younger age groups. Level of education is not a factor. To some extent household income does appear to be a factor with a higher likelihood of watching TV on the computer in the lower income categories, which may simply be an artifact of age.

Figure 3. Replaced watching programs and movies on a TV to watching them on a computer or hand-held device overall and by age, education, and household income



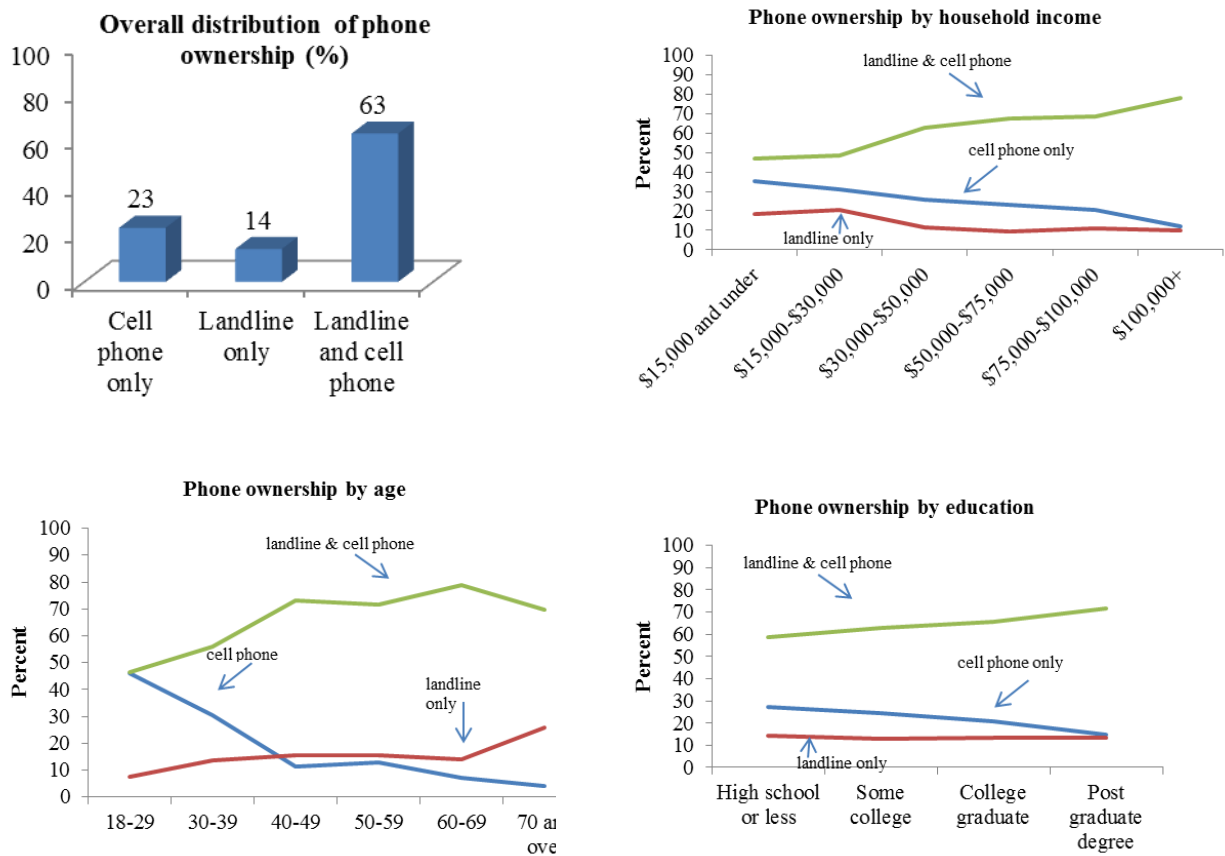
Replaced the landline telephone with the computer to make calls using, for example, Skype or Vonage. The widespread use of cell phones, particularly ‘smart phones,’ has made a considerable dent in the use of landline phones as well as the use of the computer for making cheap or free long distance phone calls. Wifi and access to the Internet on the cell phone reduces the need for the computer as telephone. There is very little acceptance of the replacement of the telephone with the computer; indeed, nearly four-fifths of households reported ‘not at all’ for this replacement. Age, education, and income do not make a difference in terms of replacement of the landline telephone with the computer.

Figure 4. Replaced the landline telephone with the computer overall and by age, education, and household income.



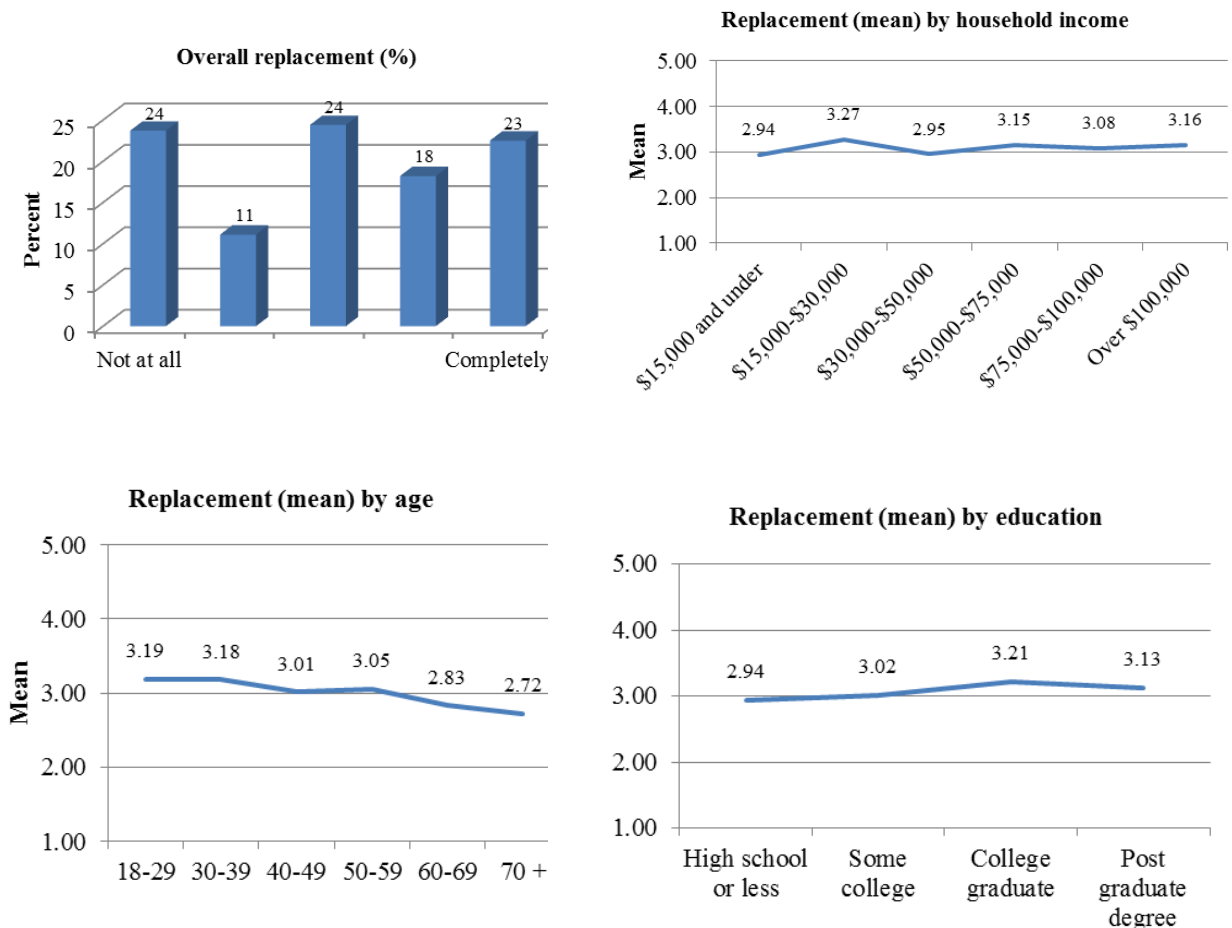
Replaced the landline telephone with the cell phone. While we did not explicitly ask about the replacement of the landline telephone with the cell phone in the household, we were able to consider landline phone replacement by using a sub-sample of cell phone only households in the survey. A separate random sample of cell phone users was done as part of the 2010 household survey; cell phone users were asked whether they had replaced the landline telephone in the home with a cell phone. While we are not able to report incidence level of landline replacement, we are able to examine the extent to which age, education and household income level are associated with different phone ownership patterns. Not too surprising, landline only households are a significantly smaller group than cell phone only and landline and cell phone households. Age is a contributing factor, as the proportion of cell phone only households is highest for the younger age groups and steadily declines with age. The age distribution for landline only, and landline and cell phone households is fairly similar across age groups though there is a decided upswing in the landline proportion for the 70 and over age group. Cell phone only owning households decrease as income increases, while there is a steady increase in landline *and* cell phone ownership as income increases. The proportion of cell phone only households versus landline and cell phone households is relatively stable across educational levels.

Figure 5. Replaced landline with cell phone overall and by age, education, and household income



Replaced printing photos with using a digital picture frame or viewing pictures online. Digital picture frames and online viewing is becoming more and more popular. Nearly one-quarter of households reported that they have completely replaced photo printing with viewing pictures online or with a digital picture frame. On the other hand, about one-quarter have not joined the digital photo revolution. Age is associated, although the differences are not very substantial. While 25% of those age 18-29 report that they have completely made the replacement, a full 19% of those age 60-69 and 18% of those over 70 years old have also replaced printing with digital. Household income levels do not differentiate nor does educational level. It appears that the digital camera significantly reduces the need for photo developing services; photo printing is now on the chopping block.

Figure 6. Replaced printing photos with digital photos overall and by age, education, and household income



Conclusions. It is clear some household physical devices are being replaced as a result of the home computer and most importantly, the Internet. It may be that the next replacement will be that of the home computer, as smart phones like the iPhone and Android become more affordable to a wider number of people and expand their list of capabilities. In any case, at the moment, we observe the significant reduction in physical newspaper ownership and the physical photo album as more people opt for viewing photos online or in rotating digital frames. On the other hand, what probably 10 years ago might have been considered the elimination of the landline phone by replacing it with the computer as a phone has not evolved as originally thought. In place of that changeover, the landline phone is being replaced by the cell phone. Instead of a family phone, the phone becomes individual. Thus far, the TV is not in danger of being replaced; rather, it is more likely that the TV will be further integrated into the digital environment. Indeed, in this survey, 22% of the respondents indicated that their TV is connected to the Internet. As a consequence, the previously thought evolution of the computer as a TV appears to be taking the opposite approach as the TV becomes more like a computer. Finally, despite corporate efforts and incentives, the paperless home is still very much in the future. The majority of households still rely on paper versions of bills, claims, insurance documents, etc. as a way of storing important data.